What Is Claimed Is:

1. A heat exchanger comprising:

a shell having a longitudinal axis and configured to receive a first fluid; and

a plurality of quadrant-shaped baffles each mounted in the shell at an angle to the longitudinal axis to guide a first fluid flow into a helical pattern though the shell at a substantially uniform velocity.

2. The heat exchanger of claim 1, wherein the angle differs from a right angle.

3. The heat exchanger of claim 1, wherein the quadrant-shaped baffles each have a respective pair of opposite sides configured to be flat or curved and a plurality of spaced apart holes configured to be traversed by a plurality of axially extending pipes carrying a second fluid in a desired position of the quadrant-shaped baffles.

4. The heat exchanger of claim 3, wherein the opposite sides of each quadrant-shaped baffle define therebetween an elliptical outer edge facing an inside of the shell and spaced therefrom at a uniform radial distance, whereas the first fluid generates a substantially uniform pressure along opposite sides of each quadrant-shaped baffle as the first fluid flows between the elliptical outer edge of the quadrant-shaped baffles and the inside of the shell at a substantially uniform velocity.

5. The heat exchanger of claim 4, further comprising a plurality of angularly spaced apart seal strips extending parallel to the longitudinal axis of the shell, each of the seal strips bridging the outer edges the quadrant-shaped baffles to secure the desired position thereof, in which the holes of adjacent quadrant-shaped baffles are aligned, and to minimize vibration produced by the pipes exposed to the first flow fluid.

6. The heat exchanger of claim 5, wherein each of the seal strips is a continuous rod having a polygonal or annular cross-section and fixed to end regions of the outer edges of the successive quadrant-shaped baffles positioned parallel to one another in a row.

7. The heat exchanger of claim 4, further comprising a plurality of axially extending tie rods each penetrating through end regions of the outer edges of a respective row of parallel quadrant-shaped baffles, and a plurality of stiffener strips coupling adjacent tie rods between the end regions of adjacent quadrant-shaped baffles to secure the desired position of the quadrant-shaped baffles and to reduce vibration.

8. The heat exchange of claim 7, wherein the stiffener strips each are a plate fixed atop the coupled tie rods.

9. The heat exchanger of claim 7, wherein the opposite sides of each quadrant-shaped baffle define therebetween a pair of flanks each formed with a row of semi-holes, wherein the semi-holes of adjacent quadrant-shaped baffles are positioned to engage the pipes common to the adjacent quadrant-shaped baffles in the desired position thereof.

10. The heat exchanger of claim 4, wherein each of the quadrant-shaped baffles has a pair of flanks converging toward one another from a respective outer edge, which has spaced apart extending end portions each overhanging a respective one of the pair of flanks and configured to overlap the extending portion of an adjacent quadrant-shaped baffle in the desired position of the quadrant-shaped baffles.

11. The heat exchanger of claim 10, wherein the extending end portions each are provided with at least one of the plurality of holes aligned with a respective hole of the extending portion of the adjacent quadrant-shaped baffle in the desired position of the quadrant-shaped baffles, wherein as the holes formed in the extending portions of the adjacent baffles are traversed by a respective pipe to secure the desired position of the quadrant-shaped baffles.

12. The heat exchanger of claim 4, wherein the plurality of quadrant-shaped baffles mounted at the angle to the longitudinal axis to define the first helical pattern of the first

fluid flow each has a respective pair of flanks converging from the outer edge and forming an apex, which is terminated on the longitudinal axis of the shell.

13. The heat exchanger of claim 12, wherein each of the apexes of the quadrant-shaped baffles has a respective notch shaped to conform to an outer surface of a central pipe centered along the longitudinal axis of the shell.

14. The heat exchanger of claim 12, further comprising another plurality of quadrant-shaped baffles mounted in the shell at the angle to guide the first fluid flow into the helical pattern, wherein the heat exchanger is provided with a double helix configuration reducing unsupported spans of the pipes between successive quadrant-shaped baffles while maintaining the uniform velocity of the first fluid flow.

15. The heat exchanger of claim 14, wherein at least a portion of the other plurality of quadrant-shaped baffles each has a respective apex provided with a respective hole traversed by the central pipe and configured so that the quadrant-shaped baffle is rotatable about a central pipe, centered about the longitudinal axis, to the desired position.

16. A shell and tube type heat exchanger comprising a series of quadrant shaped baffles traversed by a bundle of second fluid carrying pipes and configured to guide a first fluid along a helical path across the bundle of pipes, and a reinforcing unit selectively coupling the bundle of second fluid carrying pipes to minimize vibration and maximize a support thereof.

17. The shell and tube type heat exchanger of claim 16, wherein the series of quadrant-shaped baffles form a partial barrier to the first fluid and each have an outer elliptical edge for establishing a uniform flow velocity of the first fluid through clearances provided between the elliptical edges and an inside of shell.

18. The shell and tube type heat exchanger of claim 16, wherein the reinforcing unit is configured to couple the outer elliptical outer edges of at least two adjacent quadrant-shaped baffles.

19. A shell and tube type heat exchanger extending along a longitudinal axis, comprising a first string of quadrant-shaped baffles and a second string of quadrants-shaped baffles forming a double-helix arrangement traversed by a bundle of second fluid carrying pipes and positioned at an angle to the longitudinal axis to guide a first fluid into a helical pattern at a substantially uniform velocity.

20. The shell and tube heat exchanger of claim 19, wherein each of the quadrant-shaped baffles has an outer elliptical peripheral edge and two flanks converging from the elliptical peripheral toward one another to form an apex provided with an angularly drilled hole to allow angular positioning of each of the quadrant-shaped baffles with respect to the longitudinal axis in a desired sequential manner prior to securing the first and second strings of quadrant-shaped baffles relative to one another.